# **EOSDIS IV&V Monthly Status Report**

For the Period 12/1/95 to 12/31/95

(Deliverable 0203.6)

**January 16, 1996** 

# Prepared by:

#### **INTERMETRICS**

6301 Ivy Lane Greenbelt, MD 20770

# **Prepared for:**

**NASA Goddard Space Flight Center** 

Code 505 Greenbelt, MD 20770

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PREPARED BY:

Rich Saad
Task 2 Leader

APPROVED BY:

Frank Rockwell Program Manager

**INTERMETRICS** 

6301 Ivy Lane Greenbelt, MD 20770

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#### 1. PROGRAMMATIC INFORMATION

#### 1.1 IV&V Project Organization Chart

Exhibit 1-1 illustrates the current organizational structure of the EOSDIS IV&V team. The approximate number of personnel assigned to each technical task is also indicated.

#### 1.2 Overview of Work Being Performed

#### a) Key Recent Accomplishments

#### Programmatic

- Participated in Executive Council Briefing on December 12, 1995. Also, participated in Findings Meeting with ESDIS management on December 15, 1995.
- Coordinated the development and documentation of the Project Issue Tracking System (PITS). This new system will provide an automated mechanism to document and track issues such that overall IV&V effectiveness will be enhanced.
- Finalized and received approval on changes to Task SOWs. These modifications better reflect the new program direction and funding constraints.
- Witnessed ECS IR-1 developer test activities and collected metrics.
- Began developing IV&V Self Evaluation Report to assess performance during the first half of this contract year.

#### Technical

- Under Task 4B, provided major enhancement to the Issue/Discrepancy Handling System (IDHS), focusing on issue tracking and monitoring. New system called Project Issue Tracking System (PITS). Also, continued populating the EOSDIS IV&V Homepage TAM Library.
- Under Task 5B, delivered IR-1 Requirements Analysis TAM on December 17, 1995. Also initiated Release A Requirements Criticality Assessment.

**Exhibit 1-1: Org Chart (Landscape)** 

- Under Task 6, continued review of revised ECS Software Development Plan and submitted TAM on December 15, 1995. Also, witnessed 28 IR-1 tests at Hughes during December and prepared TAM.
- Under Task 7, submitted "Process Outline for Initial Independent Cost Evaluation (ICE) of EOSDIS" on December 27, 1995. Also, initiated activities for both the ECS System Development Assessment and the GSFC DAAC M&O Assessment. In addition, began designing the system architecture and data structures for the Community Cost Model (CCM).
- Under Task 9B, completed three TAMs covering ECS-to-TSDIS ICD (TAM-09-039); nine ENNet-to-AM-1 ICDs (TAM-09-040); and EBNet-to-DAACs, EBNet-to-ETS, and EBNet-to-TSDIS ICDs (TAM-09-041). Also, continued to populate and enhance the Interface Analysis Database (IADB).
- Under Task 10C, delivered preliminary draft of IR-1 Component Test Procedures. Also, developed detailed plans for staffing of component test activity, as well as preliminary training, dry runs, and contractor site tests prior to start of official component test activity.
- Under Task 11A, delivered SI&T Master Plan (Baseline) update on December 4, 1995. Also, completed development of IR-1 preliminary detailed I&T procedures and delivered on December 15.
- Under Task 13B, ran Version 0 IMS queries using the V0 WWW Gateway, and collected performance and qualitative results. Also, reviewed X-Runner scripts for possible use on V0 long term testing.

Additional status information on each of the technical tasks can be found in Appendix A.

#### b) New/Proposed Task Assignments

None.

#### 1.3 Overview of Schedule Status

Exhibit 1-2 presents the latest, high level milestone chart (i.e., dated January 3, 1996) for all technical tasks assigned on the EOSDIS IV&V contract. In addition, Exhibit 1-3 lists in chronological order the deliverables/milestones associated with the contract for both the current month and the next month, as well as the status of each deliverable/milestone.

**Exhibit 1-2: Milestone Chart (Landscape)** 

Expected	Dependency	Milestone/	Task	Status*	Comments
Date Due		Deliverable	#		
12/1/95		EOSDIS Test Version Component Acceptance Test Procedures for ECS IR-1 (Preliminary)	10C	С	Submitted on time.
12/1/95		EOSDIS Test Version I&T Procedures (Preliminary)	11A	C	Submitted two weeks late on December 15, due to SI&T Contractor oversight.
12/15/95		EOSDIS Test Version Component Acceptance Test Procedures for ECS IR-1 (Review)	10C	С	Submitted on time.
12/15/95		EOSDIS Test Version I&T Procedures (Review)	11A	D	Delayed due to Government furlough. Feedback needed from customer on Preliminary version before Review version can be delivered.
12/17/95		IR-1 Requirements Qualitative Analysis TAM	5B	C	Submitted on time.
12/27/95		Outline of Analysis Steps To Be Followed	7	C	Submitted on time.
12/27/95		List of Team Members / Contractor Points of Contact	7	C	Submitted on time.
12/27/95		Preliminary List of Documents Needed for Analysis	7	C	Submitted on time.
1/5/95		ISE M&O Status Report	4B	С	Submitted on time.
1/8/96	IR-1 Sys I&T (end)	IR-1 Test Results TAM	6	IP	
1/8/96		First Information Exchange Meeting	7	IP	
1/15/96		EOSDIS Test Version Component Acceptance Test Procedures for ECS IR-1 (Baseline)	10C	IP	
1/26/96		Basic CCM System Prototype	7	IP	
1/26/96		EOSDIS Test Version I&T Procedures (Baseline)	11A	D	Delayed due to Government furlough. Feedback needed from customer on Review version before Baseline version can be delivered.
1/31/96	ECS Rel A CDR + 5 Months	Release A IRVVP (Final)	6	IP	

<sup>\*</sup> C = Completed, IP = In Process, O = Open, D = Delayed, CX = Canceled Note: *Italics* indicates tasks that are not yet activated.

#### **EXHIBIT 1-3: Status of Milestones/Deliverables**

#### 1.4 Performance Assurance Activities

#### • Performance Assurance Activities

- IV&V personnel attended a training session in Object Oriented Database Design conducted at Hughes on December 18 through 21, 1995.
- IV&V personnel attended StP training on December 19 and 20 at the Hughes facility. This training was tailored to IV&V needs, focusing on StP model assessment and consistency checking.
- IV&V has requested attendance at Hughes' Clearcase training, which is expected to be given at the Hughes facility some time in January. (Clearcase is a CM tool which simplifies the sharing of controlled information.) Hughes has agreed that IV&V personnel may attend any relevant training activities at Hughes, so long as seats are available and advanced notice is given.
- IV&V System Administrators are planning to access the Goddard Learning Center for additional training in UNIX. This training is intended to enhance support of the Sun-based tools used on the program.

#### 1.5 Major Short Term Activities Planned

#### Program-wide Activities

- Prepare for next Findings Meeting with ESDIS management.
- Prepare materials for the upcoming EOSDIS Ground System (EGS) Status Review (ESR).
- Submit IV&V Self Evaluation Report for first half of this contract year.
- Oversee the population and implementation of the PITS system.

#### Task-specific Activities

- For Task 4B, continue PITS development and continue developing/maintaining IV&V and EGS I&T Homepages.
- For Task 5B, continue quality/trace analysis on Release A requirements. Also, propose IV&V modeling activity using Menasce model to augment Hughes endto-end modeling.

- For Task 6, develop final ECS Release A IRVVP, incorporating CARA results. Also, continue IR-1 test witnessing.
- For Task 7, conduct First ICE Information Exchange and deliver CCM Basic System Prototype.
- For Task 9B, continue populating IADB with interface issues and problems. Also, continue reviewing IADB issues list to determine if the most significant issues are also being captured on the ESDIS risk list.
- For Task 10C, finalize detailed test procedures for completion of baseline deliveries on January 15, 1996. Also, implement on-site and dry run component test support preliminary activities.
- For Task 11A, conduct test approach and action item meeting as soon as furlough is over. Also, finish revisions to SI&T IR-1 Test Procedures to incorporate joint testing activities.
- For Task 13, prepare TAM documenting results of V0 WWW Gateway testing. Also, use X-Runner to execute V0 test scenarios for "long term testing."

#### 1.6 Key Long Range Plans/Schedules

The IV&V team will support the activities and milestones identified in Exhibit 1-2. Emphasis will be placed on those activities that are on the critical path to support the on-time launch of the spacecraft. Such activities include supporting System Integration, performing Interface and Integration Testing, and conducting System Certification.

Based on recent budget constraints and new direction from NASA, the team will emphasize its System Integration and Test (SI&T) role and narrow its IV&V focus to those activities that support successful SI&T. Other IV&V functions will be secondary and will be prioritized based on available funding.

# 2. FINANCIAL/CONTRACTUAL INFORMATION

**This Section** 

**Has Been Removed** 

**Due to Proprietary Content.** 

# **APPENDIX A**

# TECHNICAL TASK STATUS INFORMATION

#### Task # 4B: IV&V Infrastructure and Tool Development

#### a) Task Accomplishments

- Provided major enhancement to the Issue/Discrepancy Handling System (IDHS).
   The new version, which will have expanded capabilities, will be called the Project Issue Tracking System (PITS).
- Continued populating the EOSDIS IV&V Homepage TAM Library with available TAMs. Authorized access to the protected TAM library for Government personnel located in Building 32 at GSFC.
- Continued developing and maintaining the EOSDIS IV&V Homepage and EGS I&T Homepage.
- Modified the Automated Requirements Database (ARDB) to include enhanced requirements traceability capabilities. Also deployed Release 1.1 at GSFC and both EOSDIS IV&V locations.
- Began procurement process for the Test Buddies needed to support EGS I&T, Component Acceptance, and ECS Certification testing activities. Provided justification and GSA pricing to initiate procurement activities.
- Modified Test Management Database (TMDB) including the uploading of TMDB Version 2.2 for the TMDB analysts to use and the creation of a new window for NASA requested test metrics.
- Performed general system administration activities including implementing a temporary solution to allow IV&V personnel to access Netware servers from home, Hughes, or other remote sites.

#### b) Issues/Concerns

 By previous agreement, IV&V expected CSC to post RID closure information to the IVV-RID mailbox as RIDs were closed. No RID closure information has been received to date regarding the August, October, or November reviews. As a result, the Issue/Discrepancy Handling System (IDHS) has not been updated to allow analysts to check the status of submitted RIDs.

#### c) Subcontractor Performance

• EWA performance during this reporting period was very good. They supported system administration activities for the Fairmont facility, as well as the development and maintenance of the EOSDIS IV&V Homepage and the EGS I&T Homepage.

#### d) Planned Activities

- Establish formal backup procedures for Sybase SQL Server RDBMS.
- Assist in maintaining currency of TMDB data.
- Continue support (refinement, development, and maintenance) for the ARDB and TMDB client/server tools.
- Continue support for the IDHS application. Update the IDHS database based upon RID closure information from past CDR and IDR activities as CSC posts closure information.
- Continue PITS development.
- Continue development and maintenance for the EOSDIS IV&V Homepage and EGS I&T Homepage.
- Support program meetings and briefings as required.

#### Task # 5B: Requirements Analysis and Traceability

#### a) Task Accomplishments

- Delivered IR-1 Requirements Analysis TAM on schedule, on December 17, 1995.
- Completed unplanned TAM identifying multiple IR-1 Requirements Baseline issues.
- Evaluated Menasce model report as directed.
- Reported requirements and modeling assessment results at IV&V Findings meeting.
- Completed training ESDIS Requirements Manager, Code 700 Engineering Manager (John Wolfgang), and IV&V COTR on the use of the ARDB.
- Initiated Release A Requirements Criticality Assessment and TAM in accordance with Task SOW.

#### b) Issues/Concerns

- Hughes plans another Release A Requirements baseline in January. Since the IV&V SOW includes only one review of each Release Requirements baseline, continued rerelease of each baseline results in 1) outdated analysis, or 2) duplicate work not planned for in the schedule.
- The Release A Criticality Analysis will be delayed by one week, since the update to the RTM Release A baseline was not received on schedule.
- Task 5B is currently understaffed to adequately support CCR review without impacting SOW TAM delivery dates.
- The Requirements-to-Operational scenario trace (i.e., 604 documentation) has been rejected as a new priority by the GSFC Requirements Manager. This will impact Task 5B's Test and Integration support activities.

#### c) Subcontractor Performance

• Subcontractor performance has been very good.

#### d) Planned Activities

- Continue quality/trace analysis on Release A requirements.
- Propose IV&V modeling using Menasce model to augment Hughes end-to-end modeling.
- Coordinate with Requirements Manager and Hughes to revise plan/schedule for supporting Requirements rework resulting from the multiple HITC Requirements baselines.
- Support program meetings and briefings as required.

#### **Task # 6: ECS Development Analysis**

#### a) Task Accomplishments

- Continued review of revised ECS Software Development Plan and submitted TAM on December 15, 1995. Met with ESDIS QA to discuss IV&V comments on revised document.
- Attended 2-day Software through Pictures (StP) training class at Hughes facility on December 19 and 20.
- Attended 4-day Object-Oriented Database Design training class at HITS facility from December 18 through 21.
- Met with ESDIS and Hughes QA to establish approach for obtaining ECS IR-1 code to be used by IV&V to calibrate McCabe tools to generate design/code metrics for ECS Releases A and B.
- Began planning and data gathering for Release A Criticality and Risk Assessment (CARA).
- Witnessed 28 IR-1 tests at Hughes during December. Also prepared IR-1 Test Results TAM. (TAM will be updated based upon ongoing test activities and submitted to NASA once the furlough is over.)
- Began analyzing SDPS requirements-to-test case traces for ECS Release A test plans and procedures document. Results will be included in a TAM to be submitted in January.

#### b) Issues/Concerns

None.

#### c) Subcontractor Performance

• Subcontractor performance has been excellent.

#### d) Planned Activities

- Continue IR-1 test witnessing. Update IR-1 Test Results Report based on ongoing test activities and submit report to ESDIS Project prior to CSR.
- Perform ECS IR-1 test witnessing at GSFC DAAC.

- Prepare for and conduct ECS Release A CARA.
- Develop final ECS Release A IRVVP, incorporating CARA results.
- Develop new Task 6 SOW for performance period starting February 1, 1996.
- Support program meetings and briefings as required.

### **Task #7: Programmatic and Process Analysis**

#### a) Task Accomplishments

- Held kickoff meetings in early December for the Community Cost Model (CCM) effort, ECS System Development Assessment, and GSFC DAAC M&O Assessment. Kickoff meeting for ECS Hardware Assessment is still TBD.
- Submitted "Process Outline for Initial Independent Cost Evaluation (ICE) of EOSDIS" on December 27, 1995.
- For ECS System Development Assessment, reviewed documents on system concept and design; conducted preliminary interviews with ECS development team; and began Function Point counting of the ECS FOS segment.
- For GSFC DAAC M&O Assessment, met with GSFC DAAC management (Greg Hunolt, Sol Broder, Steve Wharton, Paul Chan) to discuss assessment process and data collection method (i.e., questionnaire). Reviewed documents on Technical Baseline, as well as Release A/B GSFC DAAC Design Specifications.
- For CCM effort, began designing overall system architecture and data structures.
   Revised model development schedule and submitted changes to Dr. Barkstrom for his comments/approval.
- Began developing slides for First ICE Information Exchange, scheduled for early January 1996.

#### b) Issues/Concerns

- The Government furlough has caused unanticipated delays in the information gathering phase of the ICE activity, particularly with respect to the GSFC DAAC M&O Assessment. We are currently evaluating alternatives to ensure timely performance.
- The ECS Hardware Assessment has not begun as yet. This late start hampers our ability to obtain hardware assessment results within the same time frame as the other ICE assessments. In addition, the scope of the hardware assessment is still

uncertain. There is the possibility that the Government will require both EBNet and EDOS hardware to be assessed during this initial ICE effort. We plan to work with NASA to resolve this issue once the furlough is over.

• The initial ICE effort will capture only a portion of the EOSDIS costs through GFY 2000. Since the Government would like to see a roll-up of *total* EOSDIS costs, we plan to fill in the "missing" costs using already existing estimates from within the Project. We are currently working to identify where these costs can be obtained.

#### c) Subcontractor Performance

Both Software Productivity Research (SPR) and Real Decision (RD)/Gartner are
performing well. SPR has established a good rapport with Hughes personnel and is
functioning fairly independently by setting up interview sessions with the ECS
development team and conducting function point counts. RD/Gartner has
communicated regularly with Intermetrics personnel to ensure that all materials for
data gathering have been received and are clearly understood.

#### d) Planned Activities

- Conduct First ICE Information Exchange in early January.
- Deliver CCM Basic System Prototype on January 26, 1996.
- Continue Function Point counts for FOS and SCDO segments; continue in-depth interviews with ECS Release teams.
- Continue data gathering for GSFC DAAC Assessment; begin baseline and "should cost" analysis.
- Support program meetings and briefings as required.

#### Task # 9B: Key Interface Analysis

#### a) Task Accomplishments

- Completed three TAMs covering ECS-to-TSDIS ICD (TAM-09-039); nine EBNet-to-AM-1 ICDs (TAM-09-040); and EBNet-to-DAACs, EBNet-to-ETS, and EBNet-to-TSDIS ICDs (TAM-09-041).
- Provided impact statements for three CCRs including CCR 505-01-36-001 (Baseline EBNet Level 2 Requirements Document, Volume 6), CCR 505-41-14-004 (TRMM Data Archive for PR, TMI, and GV at GSFC instead of MSFC), and CCR 505-01-41-091 (Level 3 Requirements for Remote Science Software Test PGS-0915).
- Continued to populate and enhance the Interface Analysis Database (IADB).
   Activities included initiating design of new IADB Homepage that will exploit Netscape 2.0 features, populating the IADB interface problems/issues database (currently about 80 items relating to issues reported in TAMs and TARS are in the database), initiating data entry for the 7 EBNet ICDs that concern the AM-1 mission, and completing data entry for the EOSDIS-to-TSDIS ICD and the November 20 version of the ECS-to-TRMM IRD.
- Continued reviewing ESDIS Risk to determine if interface risks are consistent with Task 9 interface issues.
- Completed requirements analysis for TSDIS IRD and entered results into ARDB.
- Prepared assessment report on the Test Thread Generator feature of the TMDB.
- Interacted with counterparts at Hughes to determine status of NOAA ADC and V0 interfaces.

#### b) Issues/Concerns

• None.

#### c) Subcontractor Performance

• CTA is the task lead for this effort. Their performance has been good.

#### d) Planned Activities

- Continue populating IADB with interface issues and problems, and coordinate with responsible engineers to verify accuracy and completeness. Also, continue reviewing IADB issues list to determine if the most significant issues are also being captured on the ESDIS risk list.
- Continue developing Netscape 2.0 Homepage for the IADB.
- Complete IADB and ARDB updates for NOAA, SCF, and Version 0.
- Evaluate the resolution of CDR/IDR problems in the following updated ICDs: ECS-SCF ICD, ECS-NOAA ICD, and the ECS-V0 ICD.
- Support program meetings and briefings as required.

#### Task # 10C: EOSDIS Independent Component Acceptance Test

#### a) Task Accomplishments

- Developed and delivered preliminary draft of IR-1 Component Test Procedures on December 1, 1995. Major focus of task effort this month continued on procedure development. Review copy of procedures delivered on schedule (December 15) and placed on IV&V Home Page for community review.
- Continued to attend ETS development informal system design reviews on December 13 for HRS & SCTGEN; review for LRS will be supported in mid-January.
- Continued close coordination with Task 6 staff and COTR on contractor test witnessing activities. Achieved higher ratio of tests witnessed to total tests run than previous reporting period. Worked to identify issues related to IR-1 planned fielded capability, problem fixes, and work-arounds.
- Developed TAMs as appropriate for review of final IR-1 and revised Release A Test Plans and Procedures.
- Hired Task 10 technical lead on December 18; training program initiated early before
  official start to enable "running start" on component test activities.
- Developed detailed plans for staffing of component test activity, as well as
  preliminary training, dry runs, and contractor site tests prior to start of official
  component test activity. Prepared detailed task status and plan/procedures briefing
  for IV&V COTR.

#### b) Issues/Concerns

• Continued emphasis on training and test data for use in component test remains high on task priority list.

#### c) Subcontractor Performance

• Subcontractor performance has been good; however, continued emphasis should be placed on staff planning and time scheduling.

#### d) Planned Activities

- Finalize detailed test procedures for completion of baseline deliveries on January 15, 1996.
- Discuss and receive approval for pending CTR for FY96 Task 10 support.
- Implement on-site and dry run component test support preliminary activities.
- Develop detailed lists of needed test data and close on availability of test sources by January 15 for final procedures.
- Emphasize training for new Task 10 technical lead.
- Support program briefings as required.

#### Task # 11A: EOS Ground System Integration and Test

#### a) Task Accomplishments

- Delivered SI&T Master Plan (Baseline) update on December 4, 1995.
- Completed development of IR-1 preliminary detailed I&T procedures and delivered on December 15.
- Prepared detailed test approach plan and procedure briefing for SMO I&T team and integration manager. Original meeting and reschedule planned for December were canceled due to lack of audience. Will present and discuss test approach issues after furlough.
- Continuing work to close Action Items from DAAC One-on-One Meetings.
   Continuing discussions with Code 505 personnel on disposition status. Completed EDC minutes and draft action items; waiting for SMO feedback on minutes content prior to final distribution.

- Supported contractor test program document reviews and numerous platform meetings in support of overall integration and test effort. Emphasis this month was on Landsat 7 and SDPF coordination.
- Renewed efforts to develop a comprehensive Level 4 I&T tracking schedule. Updated full schedule developed earlier on MS Project and delivered to SMO on December 13. Adding dates for major possible joint tests and integration steps for SSI&T. Awaiting SMO comments on schedule.
- Supported ongoing analysis of joint test efforts for TRMM and Landsat 7. Need to increase focus in this area, especially for joint TRMM tests in the January 1996 time frame.
- Increased emphasis on witnessing of contractor I&T test program in factory.
  Witnessed thread and final build tests. Developed better working relationship with
  contractor and better understanding of IR-1 system features and capabilities.
  Participated developing and reviewing weekly assessment of test program and
  emerging IR-1 system.

#### b) Issues/Concerns

- Review and Baseline versions of IR-1 I&T procedures are pending SMO comments and are currently delayed due to furlough. Plans to deliver additional versions during December were canceled because of unavailability of SMO comments during the furlough.
- Training and the development/acquisition of test data remain key issues.

#### c) Subcontractor Performance

• Subcontractor performance has been good; however, continued emphasis should be placed on staff planning and time scheduling.

#### d) Planned Activities

- Continue planning for revised IR-1 and Release A schedules; incorporate SMO comments into Test Version I&T Procedures.
- Conduct test approach and action item meeting as soon as furlough is over.
- Finish revisions to SI&T IR-1 Test Procedures to incorporate joint testing activities.
- Support dry runs of test procedures as resources permit during period between system delivery and initiation of formal component test activity. Where possible, support contractor site tests to enhance system training and understanding. Work test data issues.
- Review use of TMDB and TDM tool for Task 11 support. Compete development of TMDB and transition resources to other ongoing I&T activities.
- Support program briefings as required.

#### Task # 13B: IV&V Special Studies

#### a) Task Accomplishments

- Enabled X-Runner to be operational from the Sun workstation at the IV&V facility in Greenbelt.
- Developed test procedures and scripts for Version 0 World Wide Web Gateway testing.
- Ran V0 IMS queries using the Version 0 WWW Gateway and collected performance and qualitative results.
- Initiated effort to obtain account and privileges for "saving" search criteria on Fairmont HTTP server.
- Reviewed X-Runner scripts for possible use on V0 long term testing.

#### b) Issues/Concerns

- The Government shutdown has caused some impact on Task 13 activities:
  - Four of the six DAACs involved in testing are down.
  - Component AT team meeting with customer was canceled due to furlough. Issues going unworked.

- Key I&T meetings and ECS IR-1 CSR have been delayed. Issues going unresolved.

#### c) Subcontractor Performance

• CTA is the lead for this task. Their progress has been very good.

#### d) Planned Activities

- Continue V0 IMS performance data collection for scenarios using the WWW Gateway as well as the ported client.
- Prepare TAM documenting results of V0 WWW Gateway testing.
- Continued X-Runner script generation.
- Use X-Runner to execute V0 test scenarios for "long term testing."
- Monitor X-Runner operation from Greenbelt IV&V facility and characterize any remaining problems.
- Support program meetings/briefings as required.

# Appendices B and C have been removed due to proprietary content.